

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed than said black ink, the apparatus completing a record image in a predetermined recording area on said recording medium by causing said respective recording heads to perform a plurality of recording scans in said predetermined recording area, the apparatus comprising:

data generating means, which, for each of the plurality of recording heads, uses mask patterns to form ~~generate~~ image data in ~~in~~ each of said recording scans corresponding to said predetermined recording area, the mask patterns and said image data are used to form the record image in said predetermined recording area by identifying for each scan a first allotment of said predetermined recording area in which the black image data corresponding to the first allotment is formed, and a second allotment of said predetermined area in which color image data corresponding to the second allotment is formed, so that black image data corresponding to said predetermined recording area are allotted to each of said recording scans, and color image data corresponding to said predetermined recording area are allotted to each of said recording scans;

wherein each of the mask patterns for said black image data and color image data used during the same recording scan has different allotment rates.

2. (Previously Presented) A color ink-jet recording apparatus according to claim 1, wherein mask pattern having different allotment rates are used as the mask patterns for said black image data and color image data.

3. (Previously Presented) A color ink-jet recording apparatus according to claim 1, further comprising black image data allotment rate setting means for setting, for each of said recording scans, allotment rates for the mask patterns for said black image data; and

color image data allotment rate setting means for setting, for each of said recording scans, allotment rates for the mask patterns for said color image data; wherein both said image data allotment rate setting means set different allotment rates for the mask patterns for said black image data and color image data used during the same recording scan.

4. (Original) A color ink-jet recording apparatus according to claim 3, wherein if said black image data allotment rate setting means sets an allotment rate higher than a predetermined reference allotment rate, the color image data allotment rate setting means sets an allotment rate lower than said reference allotment rate, and if said black image data allotment rate setting means sets an allotment rate lower than said reference allotment rate, the color image data allotment rate setting means sets an allotment rate higher than said reference allotment rate.

5. (Previously Presented) A color ink-jet recording apparatus according to claim 4, wherein said reference allotment rate is $100/N\%$ where N is the number of a plurality of recording scans performed in said predetermined recording area.

6. (Original) A color ink-jet recording apparatus according to claim 1, wherein when a black image is to be formed in said predetermined area, before or after the black ink is caused to impact the recording medium, at least one of said plural types of color ink is caused to impact locations onto which the black ink is ejected.

7. (Original) A color ink-jet recording apparatus according to claim 1, further comprising a thinning means, which thins said black image data at a predetermined thinning rate and causes the plural types of color ink to impact portions of the recording area in which said black image data has been thinned.

8. (Original) A color ink-jet recording apparatus according to claim 1, wherein at least one of said plural types of color ink is reactive and tends to cause said black ink to solidify or cohere when contacting with said black ink.

9. (Original) A color ink-jet recording apparatus according to claim 1, wherein said recording heads executes recording only during scans in one of the forward and backward scanning directions, and in the scanning direction in which the recording is carried out, said color recording heads are arranged in front of said black recording head.

10. (Original) A color ink-jet recording apparatus according to claim 1, wherein if said recording heads carry out recording in both the forward and backward scanning directions, then during the first recording scan, said color image data has a higher allotment rate than said black image data.

11. (Original) A color ink-jet recording apparatus according to claim 1, wherein said plural color ink types include cyan, magenta, and yellow ink.

12. (Original) A color ink-jet recording apparatus according to claim 1, wherein said recording heads exert thermal energy to generate bubbles in the ink so that energy generated by the bubbles causes the ink to be ejected.

13. (Currently Amended) A color ink-jet recording method using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed than said black ink, the method completing a record image in a predetermined recording area on said recording medium by causing said respective recording heads to perform a plurality of recording scans in said predetermined recording area, the method comprising the steps of:

for each of the plurality of recording heads, ~~generating image data for each of said recording scans corresponding to said predetermined recording area, using mask patterns and said image data to form the record image in said predetermined recording area by identifying for each scan a first allotment of said predetermined recording area in which~~

the black image data corresponding to the first allotment is formed, and a second allotment of said predetermined area in which color image data corresponding to the second allotment is formed; ~~by using mask patterns, so that black image data corresponding to said predetermined recording area are allotted to each of said recording scans, and color image data corresponding to said predetermined recording area are allotted to each of said recording scans; and~~

ejecting said black ink and said color ink from said black recording head and said color recording heads during each of said recording scans on the basis of the mask patterns for data allotted to each of said recording scans in said generating step;

wherein each of the mask patterns for said black image data and color image data used during the same recording scan has different allotment rates.

14. (Cancelled)

15. (Previously Presented) A color ink-jet recording method according to claim 13 , further comprising the black image data allotment rate setting step of setting, for each of said recording scans, allotment rates for the mask patterns for said black image data; and

the color image data allotment rate setting step of setting, for each of said recording scans, allotment rates for the mask patterns for said color image data;

wherein both said image data allotment rate setting steps set different allot rates for the division patterns for said black image data and color image data used during

the same recording scan.

16. (Original) A color ink-jet recording method according to claim 15, wherein if said black image data allotment rate setting step sets an allotment rate higher than a predetermined reference allotment rate, then the color image data allotment rate setting step sets an allotment rate lower than said reference allotment rate, and if said black image data allotment rate setting step sets an allotment rate lower than said reference allotment rate, the color image data allotment rate setting step sets an allotment rate higher than said reference allotment rate.

17. (Previously Presented) A color ink-jet recording method according to claim 16, wherein said reference allotment rate is $100/N\%$ where N is the number of a plurality of recording scans performed in said predetermined recording area.

18. (Original) A color ink-jet recording method according to claim 13, wherein when a black image is to be formed in said predetermined area, before or after the black ink is caused to impact the recording medium, at least one of said plural types of color ink is caused to impact locations onto which the black ink is ejected.

19. (Original) A color ink-jet recording method according to claim 13, further comprising a thinning step, which thins said black image data at a predetermined thinning rate and causes the plural types of color ink to impact portions of the recording

area in which said black image data has been thinned.

20. (Original) A color ink-jet recording method according to claim 13, wherein at least one of said plural types of color ink is reactive and tends to cause said black ink to solidify or cohere when contacting with said black ink.

21. (Cancelled)

22. (Original) A color ink-jet recording method according to claim 13, wherein if said recording heads carry out recording in both the forward and backward scanning directions, then during the first recording scan, said color image data has a higher allotment rate than said black image data.

23. to 24. (Canceled)

25. (Currently Amended) A method of processing image data used in a color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed than said black ink, the apparatus completing a record image in a predetermined recording area on said recording medium by causing said respective recording heads to perform a plurality of recording scans in said predetermined recording area, the method comprising

the step of:

for each of the plurality of recording heads, ~~generating image data for each of said recording scans corresponding to said predetermined recording area using mask patterns and said image data to form the record image in said predetermined recording area by identifying for each scan a first allotment of said predetermined recording area in which the black image data corresponding to the first allotment is formed, and a second allotment of said predetermined area in which color image data corresponding to the second allotment is formed;~~ ~~by using mask patterns, so that black image data corresponding to said predetermined recording area are allotted to each of said recording scans, and color image data corresponding to said predetermined recording area are allotted to each of said recording scans; and~~

wherein each of the mask patterns for said black image data and color image data used during the same recording scan has different allotment rates.

26. (Currently Amended) A program for executing image processing on image data used in a color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that ejects color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed than said black ink, the apparatus completing a record image in a predetermined recording area on said recording medium by causing said respective recording heads to perform a plurality of recording scans in said predetermined recording area, the program comprising the step of:

for each of the plurality of recording heads, ~~generating image data for each~~

~~of said recording scans corresponding to said predetermined recording area using mask patterns and said image data to form the record image in said predetermined recording area by identifying for each scan a first allotment of said predetermined recording area in which the black image data corresponding to the first allotment is formed, and a second allotment of said predetermined area in which color image data corresponding to the second allotment is formed; , by using mask patterns, so that black image data corresponding to said predetermined recording area are allotted to each of said recording scans, and color image data corresponding to said predetermined recording area are allotted to each of said recording scans; and~~

wherein each of the mask patterns for said black image data and color image data used during the same recording scan has different allotment rates.

27. (Original) A computer-readable storage medium storing the program set forth in claim 26.

28. (New) A color ink-jet recording apparatus according to claim 1, wherein the allotment rate of the mask pattern for said black image data used in one recording scan of two recording scans among said plurality of recording scans is different from the allotment rate of the mask pattern for said black image data used in the other recording scan of said two recording scans.

29. (New) A color ink-jet recording apparatus according to claim 1, wherein the allotment rate of the mask pattern for said color image data used in one

recording scan of two recording scans among said plurality of recording scans is different from the allotment rate of the mask pattern for said color image data used in the other recording scan of said two recording scans.

30. (New) A color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating thorough a recording medium at a higher speed than said black ink, the apparatus completing a record image in a predetermined recording area including pixels on said recording medium by causing said respective recording heads to perform a plurality of recording scans in the same pixel, the apparatus comprising:

data generating means, which, for each of the plurality of recording heads, uses mask patterns to generate image data for each of said recording scans corresponding to said predetermined recording area, so that black image data corresponding to said predetermined recording area are allotted to each of said recording scans, the color image data corresponding to said predetermined recording area are allotted to each of said recording scans,

wherein the allotment rates of the respective mask patterns for said black and color image data used in one recording scan of two recording scans among said plurality of recording scans are different to each other, and the allotment rates of the respective mask patterns for said black and color image data used in the other recording scan of said two recording scans are different to each other.